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F23G 7/06

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(21)Application number : 03-007695

(71)Applicant : SHINAGAWA REFRACT CO LTD

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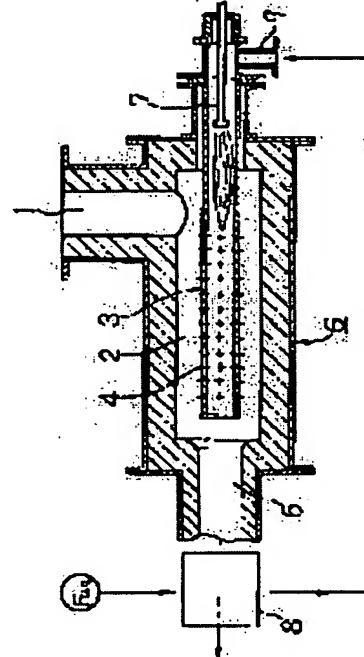
(72)Inventor : SHUKUTANI AKIO

MORISHITA MASAHIRO

**(54) DEVICE TO INCINERATE EXHAUST GAS CONTAINING ORGANIC GAS****(57)Abstract:**

**PURPOSE:** To improve an imperfect incineration of the exhaust gas that contains organic gases that are especially generated in the defatting processes for organic binders in sintering refractories, ceramics, etc. and reduce the cost.

**CONSTITUTION:** An end section of an incinerator 6 on one side is provided with an exhaust gas outlet 5, and the other end section of the incinerator 6 is provided with an introduction port 1 for the exhaust gas of an object that is incinerated and contains organic gases and a burner 3 on the same axis as the incinerator 6. The burner 3 is constituted to provide many hot gas blow-out ports 4 on the whole circumferential face inside the incinerator and at the base of the burner 3 a fuel injection nozzle 7 provided coaxially inside the burner 3. With this arrangement the efficiency of the incineration is improved and its effects of environmental pollution prevention and fuel saving are great.

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CLAIMS

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## [Claim(s)]

[Claim 1] A burner (3) is arranged the destroyed by fire exhaust gas charging hole (1) and this incinerator (6) of an incinerator (6) which, on the other hand, possess an exhaust gas outlet (5) at the edge, and contain organic gas at the another side edge of this incinerator (6), and in the shape of the same axle. This burner (3) is an organic gas content exhaust gas incineration equipment [claim 2] characterized by having established many heat gas ports (4) in the perimeter side for the interior of a furnace, and installing a fuel injection nozzle (7) inside the base of this burner (3) in the shape of the same axle. The organic gas content exhaust gas incineration equipment according to claim 1 which arranges a heat exchanger (8) in the lower stream of a river of the exhaust gas outlet (5) of said incinerator (6), and comes to prepare the hot blast inlet port for combustion (9) which is open for free passage to this heat exchanger (8) in said burner (3) base

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the organic gas content exhaust gas incineration equipment generated in the cleaning process of an organic binder at the time of baking of organic gas content exhaust gas especially refractories, a ceramic, etc.

[0002]

[Description of the Prior Art] Since organic gas content exhaust gas causes air pollution, must destroy by fire separately, must emit into atmospheric air, and a burner is conventionally installed in the core of a cylindrical incinerator. Organic gas content exhaust gas is heated at about 800 degrees C or more by assistant \*\* of this burner. Incineration effectiveness is bad, and it is necessary for this method to have imperfect mixing with the exhaust gas for incineration, and the heat gas of the burner for assistant \*\*, and to ventilate, to carry out incineration processing of the combustion air of the gas for incineration from another ventilation pipe, and to go up [ it is difficult to incinerate organic gas completely, and ] combustion temperature further for full incineration. Therefore, there are problems of rise and others versatility of incineration cost, such as needing the fuel for incineration for a large quantity.

[0003]

[Problem(s) to be Solved by the Invention] It aims at measuring an improvement and cost cut of imperfect incineration of said conventional method.

[0004]

[Means for Solving the Problem] this invention person etc. succeeds in development of this invention variously as a result of an examination experiment in order to solve many faults of the conventional method. The engineering construction of this invention possesses an exhaust gas outlet (5) at the one side edge of the incinerator (6) of a cross-section round shape as it was specified in said claim. A burner (3) is arranged in the another side edge of this incinerator (6) the destroyed by fire exhaust gas charging hole (1) and this incinerator (6) containing organic gas, and in the shape of the same axle. This burner (3) establishes many heat gas ports (4) in the perimeter side for the interior of a furnace. It is in the organic gas content exhaust gas incineration equipment characterized by installing a fuel injection nozzle (7) inside the base of this burner (3) in the shape of the same axle, and a cost cut can be further aimed at by attaching the device which carries out heat exchange of said exhaust gas and combustion air.

[0005] One example of attached this invention explains to a detail.

[0006]

[Example] As shown in drawing 1, the incinerator (for example, the cross section is circular) (6) of the organic gas content exhaust gas incineration equipment of this invention possesses a destroyed by fire exhaust gas outlet (5) at one edge, and the burner (3) is arranged the destroyed by fire exhaust gas scraper launcher (1) and this incinerator (6) which contain organic gas near the other-end section, and in the shape of the same axle. This burner (3) is considered as the configuration which has established many heat gas ports (4) in the cylinder partial perimeter side in a furnace, and installed the fuel injection nozzle (7) inside the base of this burner (3) in the shape of the same axle.

[0007] Although a cross-section configuration is not restricted circularly but is good also as a polygon, an ellipse form, etc., although said porous burner (3) is generally cylindrical, and the quality of the material is usually a product made from stainless steel It can also consider, other the heat-resisting material made from the ceramics, for example, product, 60-200mm and effective length have [ the bore ] a 500-1500mm good scale, and the aperture of a heat gas port has 30-100mm suitable for 4-12mm and this exhaust nozzle spacing.

[0008] Furthermore, in this invention equipment, it can consider as the device in which combustion efficiency is improved and a cost cut can be aimed at, by preparing a heat exchanger (8) in the lower stream of a river of said exhaust gas outlet (5), and establishing the hot blast inlet port for combustion (9) which is open for free passage to this heat exchanger (8) in a burner base.

[0009] The organic gas mentioned above is a part for un-burning [ of the fuel used at the time of the organic binder used at the time of shaping of refractories, the organic gas which occurs mainly at the time of cleaning baking of fireproof moldings, such as phenol resin or carboxymethylcellulose (CMC), and baking ].

[0010] With this invention equipment which consists of the above-mentioned configuration, feeding destroyed by fire organic gas content exhaust gas into an incinerator (6) from an exhaust gas scraper launcher (1) A burner (3) is lit. From many heat gas ports (4) of burner radiant heat and this burner Spout heat gas to the gas stream between a burner (3), a periphery, and a furnace wall destroyed by fire, and it mixes to it. Without using a fuel for a burner (3), if it considers as the emission gas which incinerated said gas destroyed by fire and lost the content of organic gas and emission gas becomes 460 degrees or more, incineration of said gas destroyed by fire is attained only by supply of air, it becomes saving of a fuel, and a cost cut can be aimed at.

[0011] the amount of the fuel for assistant \*\* used which processes 3/Hr (volatilization gas concentration: 1%) with the exhaust gas burner of structure conventionally about 100m of exhaust gas containing the volatilization gas of an organic binder - 3.0m<sup>3</sup> / Hr (67,000kcal/Hr) it was -- although -- this equipment -- the amount of the fuel for assistant \*\* used -- 1.7m<sup>3</sup> / Hr (38,000 kcal/Hr) It decreased. Consequently, incineration capacity (the amount of exhaust gas/heating value) improved from about 15m<sup>3</sup> / 104 kcal to about 26m<sup>3</sup> / 104 kcal.

[0012] As mentioned above, although the incineration equipment of a cross-section round shape was explained, this invention equipment is not limited to a cross-section round shape, and, also in a polygon, it is contained.

[0013]

[Effect of the Invention] (1) Incineration effectiveness improves, it becomes emission gas which does not contain organic gas, and air pollution is lost.

[0014] (2) When whenever [ incinerator internal temperature ] becomes 460 degrees C or more, gas destroyed by fire carries out self-

sustained combustion by supply of only air from a burner, and the energy-saving effectiveness is size.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1] It is drawing of longitudinal section showing an example of this invention equipment in schematic drawing.

[Description of Notations]

- 1 Destroyed by Fire Exhaust Gas Scraper Launcher
- 2 Incineration Room
- 3 Porous Burner
- 4 Heat Gas Port
- 5 Exhaust Gas Outlet
- 6 Incinerator
- 7 Fuel Injection Nozzle
- 8 Heat Exchanger

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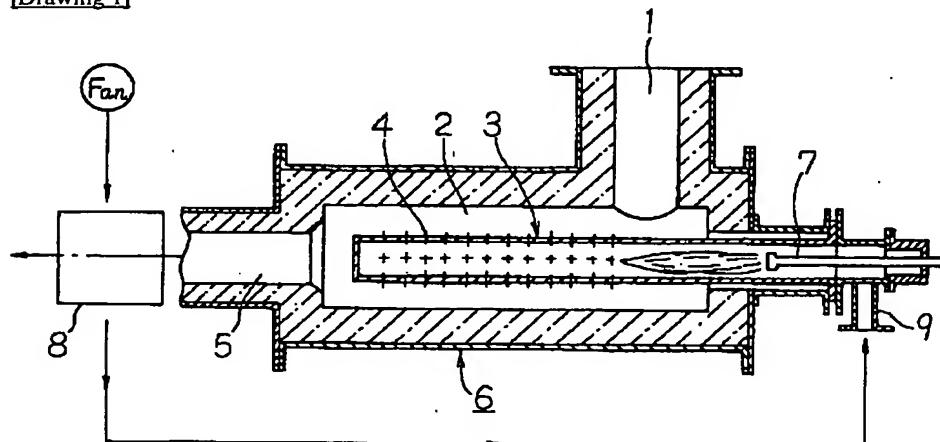
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DRAWINGS

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## [Drawing 1]



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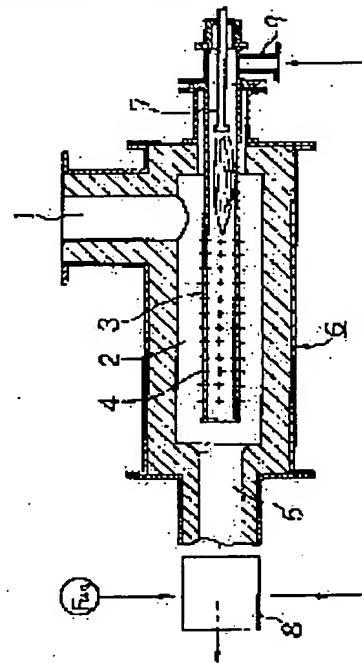
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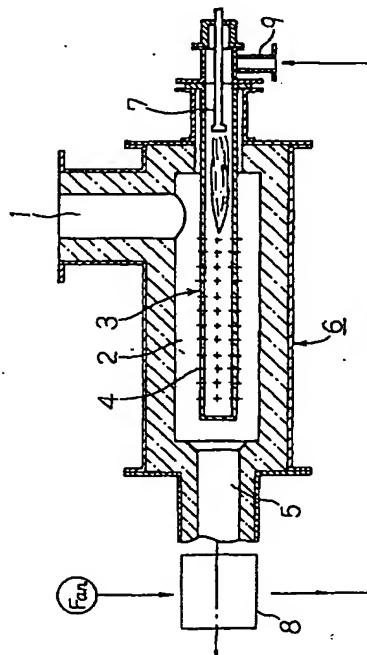
(74)代理人 弁理士 八木田 茂 (外2名)

(54)【発明の名称】 有機ガス含有排ガス焼却装置

(57)【要約】 (修正有)

【目的】 有機ガス含有排ガス、特に耐火物、セラミックなどの焼成時に有機質バインダーの脱脂工程において発生する、有機ガス含有排ガスの不完全焼却の改善とコストダウンを計る。

【構成】 焼却炉の一方端部に排ガス出口5を具備し、焼却炉の他方端部に有機ガスを含有する被焼却排ガス送入口1及び焼却炉と同軸状にバーナを配設し、バーナは炉内部分の全周面に多数の熱ガス噴出口4を設け、バーナの基部に燃料噴射ノズル7を同軸状に内設した構成であり、焼却効率の向上、公害防止並びに燃費節約の効果大である。



## 【特許請求の範囲】

【請求項1】 焼却炉(6)の一方端部に排ガス出口(5)を具備し、該焼却炉(6)の他方端部に有機ガスを含有する被焼却排ガス装入口(1)及び該焼却炉(6)と同軸状にバーナ(3)を配設し、該バーナ(3)は炉内部の全周面に多数の熱ガス噴出口(4)を設け、該バーナ(3)の基部に燃料噴射ノズル(7)を同軸状に内設したことを特徴とする有機ガス含有排ガス焼却装置

【請求項2】 前記焼却炉(6)の排ガス出口(5)の下流に熱交換器(8)を配設し、前記バーナ(3)基部に該熱交換器(8)に連通する燃焼用熱風入口(9)を設けてなる請求項1記載の有機ガス含有排ガス焼却装置

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は有機ガス含有排ガス、特に耐火物、セラミックなどの焼成時に有機質バインダーの脱脂工程において発生する、有機ガス含有排ガス焼却装置に関する。

## 【0002】

【従来の技術】 有機ガス含有排ガスは大気汚染の原因となるため、別途焼却して大気中に放出しなければならず、従来は円筒型焼却炉の中心部にバーナを設置して、このバーナの助燃によって有機ガス含有排ガスを約80°C以上に加熱して、別の送風パイプより焼却用ガスの燃焼空気を送風して焼却処理しており、この方式は焼却用排ガスと助燃用バーナの熱ガスとの混合が不完全で焼却効率が悪く、有機ガスを完全に焼却することが困難であり、完全焼却には更に燃焼温度を上昇する必要がある。従って、焼却用燃料を多量に必要とするなど焼却コストの上昇その他の種々の問題がある。

## 【0003】

【発明が解決しようとする課題】 前記従来方式の不完全焼却の改善とコストダウンを計ることを目的とする。

## 【0004】

【課題を解決するための手段】 本発明者等は従来方式の諸欠点を解決するため、種々検討実験の結果本発明の開発に成功したものであり、本発明の技術的構成は前記特許請求の範囲に明記したとおり、断面円形の焼却炉

(6)の一方端部に排ガス出口(5)を具備し、該焼却炉(6)の他方端部に有機ガスを含有する被焼却排ガス装入口(1)及び該焼却炉(6)と同軸状にバーナ

(3)を配設し、該バーナ(3)は炉内部の全周面に多数の熱ガス噴出口(4)を設け、該バーナ(3)の基部に燃料噴射ノズル(7)を同軸状に内設したことを特徴とする有機ガス含有排ガス焼却装置にあり、前記排ガスと燃焼用空気を熱交換する機構を付設することにより一層コストダウンを図りうるものである。

【0005】 添付した本発明の一具体例により詳細に説明する。

## 【0006】

【実施例】 図1に示す如く、本発明の有機ガス含有排ガス焼却装置の焼却炉(例えは横断面が円形)(6)は一方の端部に焼却済排ガス出口(5)を具備し、他方の端部近くに有機ガスを含有する被焼却排ガス送入口(1)及び該焼却炉(6)と同軸状にバーナ(3)が配設してある。該バーナ(3)は炉内の円筒部分全周面に多数の熱ガス噴出口(4)が設けてあり、また、該バーナ(3)の基部には燃料噴射ノズル(7)を同軸状に内設した構成としてある。

【0007】 前記多孔バーナ(3)は一般的に円筒状であるが、横断面形状は円形に限らず多角形、楕円形等としてもよく、その材質は通常ステンレス鋼製であるが、他の耐熱材料、例えばセラミックス製とすることもでき、その内径は60~200mm、有効長さは500~1500mmの規模がよく、熱ガス噴出口の口径は4~12mm、該噴出口間隔は30~100mmが好適である。

【0008】 更に、本発明装置においては、前記排ガス出口(5)の下流に熱交換器(8)を設け、バーナ基部に該熱交換器(8)に連通する燃焼用熱風入口(9)を設けることにより、燃焼効率を向上しコストダウンを図りうる機構とすることができます。

【0009】 前述した有機ガスとは耐火物の成形時に用いられる有機質バインダー、主としてフェノール樹脂又はカルボキシ・メチル・セルローズ(CMC)等の耐火成形物の脱脂焼成時に発生する有機ガス及び焼成時に用いられる燃料の未燃焼分である。

【0010】 前述の構成からなる本発明装置では、被焼却有機ガス含有排ガスを排ガス送入口(1)より焼却炉(6)に送入しながら、バーナ(3)を着火し、バーナ輻射熱と該バーナの多数の熱ガス噴出口(4)より、バーナ(3)と外周と炉内壁間に被焼却ガス流に熱ガスを噴出、混合し、前記被焼却ガスを焼却し有機ガスの含有量をなくした放出ガスとするものであり、放出ガスが460°以上になるとバーナ(3)には燃料を用いることなく、空気の供給のみで前記被焼却ガスの焼却が可能となり、燃料の節約となり、コストダウンが図れる。

【0011】 従来構造の排ガス燃焼装置で、有機バインダーの揮発ガスを含む排ガス約100m³/Hr(揮発ガス濃度:1%)を処理する助燃用燃料の使用量は3.0m³/Hr(67,000kcal/Hr)であったが、本装置では助燃用燃料の使用量は1.7m³/Hr(38,000kcal/Hr)に減少した。この結果、焼却能力(排ガス量/熱量)は約15m³/10⁴kcalから約26m³/10⁴kcalに向上した。

【0012】 以上、断面円形の焼却装置について説明したが、本発明装置は断面円形に限定するものではなく、多角形の場合も含まれる。

## 【0013】

【発明の効果】 (1) 焚却効率が向上し、有機ガスを含

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有しない放出ガスとなり大気汚染がなくなる。  
 【0014】(2) 焼却炉内温度が460°C以上になる  
 とバーナより空気のみの供給で被焼却ガスが自燃し、省  
 エネルギー効果が大である。

【図面の簡単な説明】

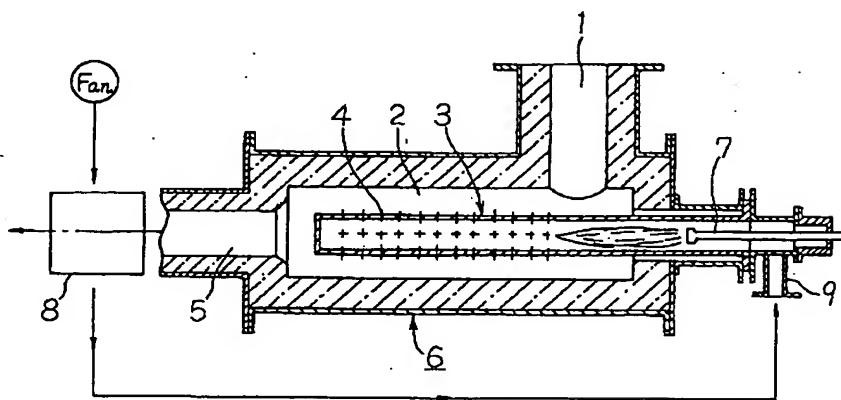
【図1】本発明装置の一例を略図的に示す縦断面図であ  
 る。

【符号の説明】

4

- \* 1 被焼却排ガス送入口
- 2 焼却室
- 3 多孔バーナ
- 4 熱ガス噴出口
- 5 排ガス出口
- 6 焼却炉
- 7 燃料噴射ノズル
- \* 8 熱交換器

【図1】



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